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REMARKS

The Office Action dated 24 March 2005 has been reviewed, and the comments of the U.S. Patent Office have been considered. Claims 1-16 were canceled without prejudice or disclaimer as being directed to the subject matter of the parent to the present divisional application, claims 19 and 23 are currently amended, and claims 17, 18 and 20-22 remain as originally filed. Thus, claims 17-23 are submitted for reconsideration.

The Examiner is thanked for indicating that claims 19 and 23 contain allowable subject matter. In accordance with the Examiner's helpful suggestion, these claims have been rewritten in independent form and are respectfully submitted to be allowable.

Claims 17, 18, and 20-22 appear to have been rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,235,954 to Sverdlin in view of U.S. Patent No. 6,481,421 to Reiter and further in view of U.S. Patent No. 2,846,028 to Gunther. These rejections are respectfully traversed in view of the following comments.

Applicant's independent claim 17 recites a method of supporting an actuator element in a fuel injector that includes, *inter alia*, "maintaining one end of the actuation element constant with respect to the compensator when the magnetic flux is generated." Support for this combination of features may be found in Applicant's originally filed specification at, for example, paragraph 0039. Specifically, according to a preferred embodiment, at the time an injection event occurs, energizing coil 129 causes both magnetostrictive member 124 to expand and magnetically active fluid 136 to change state, i.e., behave as a fluid in a solid state. Thus, compensator 130 provides a solid base against which the reaction force of the magnetostrictive member 124 is directed, thereby directing the action of magnetostrictive member 124 to opening closure member 108 with respect to injector seat 112.

In sharp contrast, none of the relied-upon references shows or describes the claimed features. Sverdlin shows a fuel injector 10 including a fuel injection control needle valve 38 and a fuel injection needle valve 50. Respective permanent magnets 40 and 43 urge fuel injection control needle valve 38 toward seat 42 and fuel injection needle valve 50 toward seat 54, i.e., urge fuel injection control needle valve 38 and fuel injection needle valve 50 away from one another. *See* Sverdlin at column 7, line 68, to column 8, line 7. Sverdlin also states at column 8, lines 11-15, that separate pressurized control magnetic fluid is provided through port 60 and passage 62 "to urge continuously fuel injection valve 50 and fuel injection control valve 38

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toward seated closed positions." Moreover, Sverdlin states that the magnetic fluid control pressure provides a magnetohydrodynamic seal "which centers valves 38 and 50 while preventing penetration of fuel within the clearance" (column 11, lines 47-52) and "[b]oth needle valves 38 and 50 are closed by magnetic fluid control pressure and by electromagnetic force created by coils 63 and 64" (column 11, lines 55-57). Thus, it is respectfully submitted that Sverdlin uses magnetic fluid in a dynamic capacity rather than to maintain one end of the actuation element constant, as recited in Applicant's claim 17.

Additionally, it is noted that in contrast to Applicant's invention, and in contrast to assertions in the Office Action, Sverdlin fails to show a magnetostrictive member (element 40 cited in the Office Action is identified by Sverdlin as a permanent magnet) or a piezoelectric stack (element 63 cited in the Office Action is identified by Sverdlin as an electromagnetic coil).

The Office Action acknowledges that Sverdlin's compensator 58 fails to include a plunger disposed in a sleeve. Reiter is relied upon by the Office Action to allegedly overcome this deficiency. Reiter shows a compensating element 2 that adjusts a retention force and position of a fuel injection valve 1 with respect to a cylinder head 6. *See also* Reiter at, for example, column 2, lines 22-33. Even if Sverdlin and Reiter could be combined, a proposition that Applicant does not accept, Reiter suggests an external mounting adjuster, which is respectfully submitted to be different from a plunger disposed within a sleeve.

As discussed above, and as stated in the Office Action, Sverdlin does not teach the ability to maintain one end of the actuation element constant with respect to the compensator when the magnetic flux is generated. The Office Action relies on Gunther to allegedly overcome this deficiency. However, Gunther states at column 2, lines 24-28, that magnetization of a fluid 3 in the region of a constriction 4 causes an increase in resistance to expulsion of the fluid 3 through the constriction 4. According to Gunther, "resistance thus created to oppose or damp the motion is a function of the strength of the magnetic field" (column 2, lines 29-31). Thus, Gunther would still fail to overcome the deficiencies of Sverdlin. Specifically, it is respectfully submitted that maintaining Gunther's piston 2 in place with respect to the rest of the damping device would require an infinite strength magnetic field given that Gunther's resistance is a function of the magnetic field strength.

Additionally, even if Sverdlin and Gunther could be combined, a proposition that Applicant also does not accept, it is respectfully submitted that the proposed modification

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suggested in the Office Action would impermissibly render Sverdlin unsatisfactory for its intended purpose. *See* M.P.E.P. § 2143.01.

Thus, for at least any of the above reasons, it is respectfully submitted that none of the applied prior art, whether considered individually or in combination, teach or suggest Applicant's combinations of features as recited in independent claim 17, and therefore the rejection under 35 U.S.C. § 103(a) of this independent claim should be withdrawn. It is respectfully submitted that claim 17 is patentable over Sverdlin, Reiter and/or Gunther.

Claims 18 and 20-22 depend from independent claim 17, and therefore recite the same patentable combination of features, as well as reciting additional features that further distinguish over the applied prior art. Thus, it is respectfully submitted that the rejections under 35 U.S.C. § 103(a) of claims 18 and 20-22 should be withdrawn, and that these claims also are patentable over the applied prior art.

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CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this Application and the prompt allowance of claims 17-23.

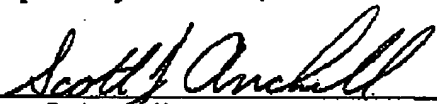
Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact the undersigned to expedite prosecution of the application.

EXCEPT for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§ 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account 08-1641. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

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